

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claim 15 is rejected under 35 U.S.C. 102(b) as being anticipated by Lin '854.

Lin teaches a UV (solar) protection glazing comprising a glass plate covered with a composition of cerium oxide and silica in the form of a sol-gel (gel). See column 1, lines 7-11; examples; and claim 1.

Claim Rejections - 35 USC § 102/103

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-2 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over JP'645.

JP'645 teaches a process of forming gels, in particular of forming a $\text{TiO}(\text{OH})_2$ (titanium oxide based) gel where the $\text{TiO}(\text{OH})_2$ exists in fibers, see abstract.

JP'645 is silent about the makeup and structural properties of the fibers as required by claim 1, however one of ordinary skill in the art at the time of the invention would have recognized these properties as inherent. Since the compound of JP'645 has the same formula as that of the instant claim, and since the compound of JP'645 exists in the same form as that of the instant claim (as fibers making up a gel), the structural properties of the substance in JP'645 would necessarily be the same as those recited in instant claim 1.

To be more specific the distance between concentrically wound fibers, the periodicity of the fibers, and the makeup of each fiber (octahedral) are only dependent upon the compound making up the fiber; and the method of connecting the molecules (edge-sharing) and the method of connecting chains of the molecules are dependent only upon the specific compound. Since the compound of JP'645 is the same as that of instant claim 1 as well as the same form (fibers making up a gel), the limitations of instant claim 1 such as -- the distance between concentrically wound fibers, the periodicity of the fibers, the makeup of each fiber (octahedral), the method of connecting the molecules (edge-sharing), and the method of connecting chains of the molecules — would necessarily be inherent in JP'645. See MPEP 2112.01 Section II.

In regard to claim 2, the compound in JP'645 according to its molecular formula contains titanium in the oxidation state +4. Since the polymer composition of the instant claim is the same as that of JP'645, and since properties such as translucence are dependent upon the substance, it is inherent that the compound of JP'645 would necessarily be translucent.

Therefore, claims 1-2 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over JP '645.

In the alternative, JP'645 fails to mention the characteristics of the fiber and the periodicity of the fibers. However, one of ordinary skill in the art would have been motivated to produce the properties recited in claims 1-3 in order to produce a form of titanium oxide that is easy to use industrially, i.e. using the fibers in the industrially applicable gel or sol, to exploit the known light absorption/shielding capabilities of titanium oxide compounds, see evidentiary document US5403513, col. 7, lines 57-62.

Claim Rejections - 35 USC § 103

The text of those sections of Title 35, U.S. Code is included in this action in the above 102/103 rejection.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.

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4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over JP'645.

JP'645 teaches the limitations of claim 1, see 102/103 rejection above.

JP'645 fails to teach titanium in a +3 oxidation state. However, it is well known that titanium compounds change oxidation states upon exposure to UV light. Thus one of ordinary skill in the art would have found it obvious that at least some of the titanium of JP'645 would be in the +3 oxidation state due to exposure to ordinary daylight. Titanium in the +3 oxidation state is well known to provide color (especially green), see evidentiary document US4367280 col. 17, lines 13-15, and since the compound of JP'645 contains titanium in the +3 oxidation state, the compound would necessarily have coloration (such as green).

Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Graetzel '644 in view of JP'645.

GRAETZEL teaches a photovoltaic cell in which the anode (photoanode) and the cathode (photocathode) comprise a conductive glass plate covered with a doped titanium dioxide compound, wherein the anode and the cathode are separated by an electrolyte; see Figure 1. It is well known in the art to use in an electrochemical device an anode with a metal or metal oxide with the metal in a lower oxidation state than the metal in the cathode.

GRAETZEL does not teach using the compound of instant claim 1 to coat the glass plate.

Titanium dioxide is recognized in the prior art to have a wide band gap and therefore the titanium dioxide does not absorb light in the visible spectrum; see GRAETZEL column 1 lines 11-15.

Therefore it would have been obvious to one of ordinary skill in the art that other known titanium oxide compounds similar to JP'645 would be operable. Since other titanium compounds like the doped compound of GRAETZEL are found to have at least moderate success, one of ordinary skill in the art would be motivated to use known options (i.e. the compound of JP'645) with a reasonable expectation of success. Since the compound of JP'645 is well known to be in +3 and +4 oxidation states, and since it is known to use an anode with a metal or metal oxide with the metal in a lower oxidation state than the metal in the cathode (this is how batteries are made), it would have been obvious to one of ordinary skill in the art to use the compound of JP'645 in the +3 form in the anode and the +4 form in the cathode.

Allowable Subject Matter

Claims 4 and 12-13 are allowed.

The following is an examiner's statement of reasons for allowance: the cited prior art of record does not teach or suggest the process of forming the titanium oxide fibers as claimed. Furthermore, the closest prior art JP'645 does not teach or suggest such a

process, and instead teaches a process using different reactants and process steps than those instantly claimed.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Claims 5-11 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: the cited prior art of record does not teach or suggest the process of forming the titanium oxide fibers as claimed. Furthermore, the closest prior art JP'645 does not teach or suggest such a process, and instead teaches a process using different reactants and process steps than those instantly claimed.

Response to Arguments

Applicant's arguments filed 4/7/2008 have been fully considered but they are not persuasive.

Applicant argues that since the product of JP'645 is produced by a different process, i.e. one using an insoluble organic binder, that the product of JP'645 is not the same as the claimed product.

However, JP'645 teaches the same polymer fiber $\text{TiO}(\text{OH})_2$ as claimed. Where the claimed and prior art products are identical or substantially identical a *prima facie* case of either anticipation or obviousness has been made. The *prima facie* case can be rebutted by **evidence** showing that the prior art products do not necessarily possess the characteristics of the claimed process. See MPEP 2112.01 Section I. No evidence in this regard has been presented. Applicant simply argues that the method of JP'645, in particular the step of using an insoluble organic binder, would produce a polymer with different characteristics thus, only alleging that the processes are different without providing evidence of, or at least using scientific reasoning to point out the specific structural effects such a process difference would have on the product. Thus, in the absence of evidence to the contrary, it is the examiner's position that since the compositions of the polymer fibers are the same, the other properties would also be the same as properties of identical chemical compositions cannot have mutually exclusive properties. See MPEP 2112.01 Section II. Also, as seen in product-by-process practice, a product that is the same or obvious from the prior art is unpatentable even though the prior art product was made by a different process. See MPEP 2113.

Applicant argues that the rejection of claim 3 under 35 U.S.C. 103(a) is improper because inherency cannot be used to provide a basis for a *prima facie* case of obviousness.

However, MPEP 2112.01 Section I states, "When the claimed and prior art products are identical or substantially identical in structure or composition, or are produced by identical or substantially identical processes, a *prima facie* case of either

anticipation **or obviousness** has been established." Thus the examiner's case of obviousness is seen to be proper.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ANTHONY J. ZIMMER whose telephone number is (571)270-3591. The examiner can normally be reached on Monday - Friday 7:30 AM - 5:00 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stanley Silverman can be reached on 571-272-1358. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

ajz

/Steven Bos/
Primary Examiner, Art Unit 1793